

Part 1 – Listing of Claims showing Amendments

1. (Currently Amended) A gas-assisted electrosurgical accessory connector ~~formed by two mating pieces connectable to one another with a relative connection movement along an axis toward one another; having a male mating piece and a female mating piece which interconnect together to conduct RF electrical~~
5 ~~energy and a gas flow from a gas-assisted electrosurgical unit to an electrosurgical accessory; the gas-assisted electrosurgical unit including an electrosurgical generator which generates RF electrical energy and a gas delivery apparatus which delivers the gas flow; the electrosurgical accessory including the male mating piece, an accessory hose, an accessory conductor, a nozzle connected to receive the gas flow from the~~
10 ~~accessory hose and to issue the gas flow as a flow stream, and an electrode positioned within the nozzle and connected to the accessory conductor to transfer the RF energy to ionize conductive pathways within the flow stream; the male mating piece including a gas passageway that is adapted to be fluidly connected to the accessory hose, the male mating piece also including a connector electrode that is~~
15 ~~adapted to be electrically connected to the accessory conductor; the female mating piece including an electrical terminal that is adapted to receive the RF energy generated by the electrosurgical generator and to electrically contact the connector electrode of the male mating piece upon interconnection of the female and male mating pieces, the female mating piece also including an internal gas flow path that is~~
20 ~~adapted to receive the gas flow delivered from the gas delivery apparatus and to conduct the gas flow to the gas passageway of the male mating piece upon interconnection of the female and male mating pieces with a relative connection movement along an axis toward one another; the accessory connector further comprising:~~
25 a sealing surface formed on one mating piece and extending generally parallel with the axis for a distance along the axis; and
 a resilient radial sealing member carried on the other mating piece at a location which contacts and seals against the sealing surface principally with radial compression force upon the two mating pieces connecting with during a range of

30 relative axial connection movement extending from before the two mating pieces
achieve a fully connected relationship.

2. (Currently Amended) An accessory connector as defined in claim 1,
~~wherein the accessory connector conducts a gas flow and RF electrical energy~~
~~between the two mating pieces, and wherein:~~

the sealing surface extends parallel to the axis over a predetermined
5 length; and

the predetermined length of the sealing surface permits the sealing
member to contact and seal against the sealing surface over the [[a]] range of relative
connection movement ~~of the two mating pieces~~ approximately equal to a portion of
the predetermined length of the sealing surface along the axis.

3. (Currently Amended) An accessory connector as defined in claim 1,
[[2,]] wherein:

the ~~connected mating pieces define a~~ gas passageway and the internal
gas flow path are circumscribed by the sealing surface and the contact of the sealing
5 member with the sealing surface; and

the ~~connecting mating pieces define an electrical conductor~~ connector
electrode and the electrical terminal are circumscribed by the sealing surface and the
contact of the sealing member with the sealing surface. ~~surface;~~

~~the gas flow is conducted through the gas passageway; and~~
10 ~~the RF electrical energy is conducted by through the conductor.~~

4. (Original) An accessory connector as defined in claim 1, wherein:
the sealing surface is generally cylindrically-shaped and concentric
about the axis.

5. (Original) An accessory connector as defined in claim 4, wherein:
the sealing member is annularly shaped.

6. (Original) An accessory connector as defined in claim 5, wherein:
the sealing member comprises a resilient O-ring.

7. (Currently Amended) An accessory connector as defined in claim 6,
wherein:

the other mating piece ~~second connector~~ includes an extension which extends concentrically about the axis;

5 the O-ring is retained on the extension; and

the O-ring compresses substantially only radially between the extension and the sealing surface.

8. (Currently Amended) An accessory connector as defined in claim 7, ~~wherein the accessory connector conducts a gas flow and RF electrical energy between the two mating pieces, and wherein:~~

5 the generally cylindrically-shaped sealing surface extends concentrically along the axis over a predetermined length; and

the predetermined length of the sealing surface permits the O-ring to contact, move along and seal against the sealing surface over the ~~the~~ [[a]] range of relative connection movement approximately equal to ~~a portion of~~ the predetermined length of the sealing surface along the axis when the mating pieces connect with
10 relative connection movement.

9. (Currently Amended) An accessory connector as defined in claim 8, wherein:

the extension is hollow;

the gas moves through the hollow extension; and

5 at least one of the ~~mating pieces includes an~~ electrical terminal or connector electrode ~~which~~ extends through the hollow extension. ~~extension and conducts the electrical energy.~~

10. (Currently Amended) An accessory connector as defined in claim 1, further comprising:

a retention mechanism operative between the connected mating pieces to restrain ~~when connected with relative connection movement, the retention~~
5 ~~mechanism restraining~~ the connected mating pieces against separation from one another by ~~[[with]]~~ movement of the connected mating pieces away from one another along the axis.

11. (Currently Amended) A gas-assisted electrosurgical accessory connector formed by two mating pieces connectable to one another with a relative connection movement along an axis toward one another, comprising: An accessory connector as defined in claim 10

5 a sealing surface formed on one mating piece and extending generally parallel with the axis for a distance along the axis;

a resilient radial sealing member carried on the other mating piece at a location which contacts and seals against the sealing surface with radial force upon the two mating pieces connecting with relative connection movement;

10 a retention mechanism operative between the mating pieces when connected with relative connection movement, the retention mechanism restraining the connected mating pieces against separation from one another with movement away from one another along the axis, wherein the retention mechanism further comprises:

15 a recess formed on one of the mating pieces; and

 a retention member carried on the other one of the mating pieces, the retention member moving into the recess upon the two mating pieces connecting with relative connection movement, the retention member moving out of the recess with manual force applied between the two connected mating pieces to separate the
20 connected mating pieces from one another.

12. (Original) An accessory connector as defined in claim 11, wherein:

 the one of the mating pieces upon which the recess is formed includes a cylindrical end portion;

 the other one of the mating pieces upon which the ~~biased~~ retention
5 member is carried comprises an annular slot into which the cylindrical end portion extends upon connection of the mating pieces with relative connection movement;

 the cylindrical end portion includes a detent formed therein;

 the recess includes the detent; and

 the biased retention member includes a ball positioned in the other one
10 of the mating pieces at a position within the annular slot to contact and extend within

the detent upon connection of the mating pieces with relative connection movement and to withdraw from within the detent upon separation of the mating pieces from one another.

13. (Original) An accessory connector as defined in claim 12, wherein the retention mechanism further comprises:

a biasing member operative between the ball and the other one of the mating pieces to bias the ball into the detent upon connection of the mating pieces
5 and to resist withdrawal of the ball from the detent upon separation of the mating pieces.

14. (Original) An accessory connector as defined in claim 13, wherein:
the biasing member comprises a coil spring.

15. (Currently Amended) An accessory connector as defined in claim 13,
wherein:

the cylindrical end portion includes a forward facing cylindrical contact
surface;

5 a plurality of detents are formed and circumferentially spaced at
locations in the forward facing contact surface;

the one mating piece includes a channel having an outer end which
opens into the annular slot;

the ball is positioned within the channel; and

10 the biasing member comprises a coil spring located within the channel
to bias the ball into contact with the detents and the forward facing contact surface of
the cylindrical end portion upon connection of the mating pieces with relative
connection movement.

16. (Currently Amended) A gas-assisted electrosurgical accessory
connector having a male mating piece and a female mating piece which interconnect
together to conduct RF electrical energy and a gas flow from a gas-assisted
electrosurgical unit to an electrosurgical accessory; the gas-assisted electrosurgical
5 unit including an electrosurgical generator which generates RF electrical energy and a
gas delivery apparatus which delivers the gas flow; the electrosurgical accessory

including the male mating piece, an accessory hose, an accessory conductor, a nozzle connected to receive the gas flow from the accessory hose and to issue the gas flow as a flow stream, and an electrode positioned within the nozzle and
10 connected to the accessory conductor to transfer the RF energy to ionize conductive pathways within the flow stream; the male mating piece including a gas passageway that is adapted to be fluidly connected to the accessory hose, the male mating piece also including a connector electrode that is adapted to be electrically connected to the accessory conductor; the female mating piece including an electrical terminal that is
15 adapted ~~connected~~ to receive the RF energy generated by the electrosurgical generator and to electrically contact the connector electrode of the male mating piece upon interconnection of the female and male mating pieces, the female mating piece also including an internal gas flow path that is adapted ~~connected~~ to receive the gas flow delivered from the gas delivery apparatus and to conduct the gas flow to the gas
20 passageway of the male mating piece upon interconnection of the female and male mating pieces; the accessory connector further comprising:

an annular and radially compressible gas seal member attached to the male mating piece and surrounding the gas passageway; and

an outer wall attached to the female mating piece and surrounding the
25 internal gas flow path, the outer wall defining a cylindrical recess therein, the cylindrical recess receiving the annular gas seal member in radial compression against the cylindrical recess to create a gas tight connection between the gas flow path and the gas passageway upon interconnection of the male and female mating pieces.

17. (Original) An accessory connector as defined in claim 16, wherein the female and male mating pieces include complementary threads which mesh with one another upon screwing the male mating piece into the female mating piece to interconnect the mating pieces, the accessory connector further comprising:

5 a retaining mechanism including a biasing element connected to one of the mating pieces to bias the male mating piece against unscrewing from the female mating piece.

18. (Original) An accessory connector as defined in claim 17, wherein:
the male mating piece has a forward edge;
the retaining mechanism includes a series of detents on the forward
edge of the male mating piece;
5 the retaining mechanism includes a ball connected to the female mating
piece at a location to fit within a detent upon interconnection of the female and male
mating pieces; and
the biasing element comprises a spring connected to the ball to bias the
ball into the detent upon interconnection of the female and male mating pieces to
10 restrain the male mating piece against unscrewing from the female mating piece.
19. (Original) An accessory connector as defined in claim 16, wherein the
gas seal member comprises an O-ring.
20. (Original) An accessory connector as defined in claim 19, wherein the
male mating piece includes a hollow sleeve member and an interior hub member
surrounded by the sleeve member and confined within the sleeve member, the sleeve
member rotating relative to the hub member, the sleeve member including external
5 threads, and the gas passageway extending through the hub member; the female
mating piece including a receptacle housing which defines an interior receptacle with
interior threads, the interior gas flow extending through the receptacle housing and
into the receptacle; the male mating piece is interconnected to the female mating
piece by screwing the threads of the sleeve member into the threads of the
10 receptacle, and the gas passageway extends through the hub member, and wherein:
the O-ring is attached to the hub member.
21. (Original) An accessory connector as defined in claim 16, wherein the
electrical terminal is at least partially within the gas flow path, the accessory
connector further comprising:
a terminal seal connected around the electrical terminal to create a gas
5 tight seal between the electrical terminal and the female mating piece to prevent gas
from flowing from the gas flow path out of the female mating portion around the
electrical terminal.

22. (Currently Amended) An improved mating piece of a gas-assisted electrosurgical accessory connector to be used with another ~~an other~~ mating piece ~~piece~~, the two mating pieces interconnecting connectable together with a relative connection movement along an axis toward one another, the accessory connector

5 conducting a gas flow and RF electrical energy from a gas-assisted electrosurgical unit through the two connected ~~between the first and second mating pieces~~, mating pieces to an electrosurgical accessory; the gas-assisted electrosurgical unit including an electrosurgical generator which generates the RF electrical energy and a gas delivery apparatus which delivers the gas flow; the electrosurgical accessory including

10 an accessory hose, an accessory conductor, a nozzle connected to receive the gas flow from the accessory hose and to issue the gas flow as a flow stream, and an electrode positioned within the nozzle and connected to the accessory conductor to transfer the RF energy to ionize conductive pathways within the flow stream; the one mating piece including a gas passageway that is adapted to be fluidly connected to

15 the accessory hose, the one mating piece also including a connector electrode that is adapted to be electrically connected to the accessory conductor; the other mating piece including an electrical terminal that is adapted to receive the RF energy generated by the electrosurgical generator and electrically contact the connector electrode of the one mating piece upon interconnection of the two mating pieces with

20 the relative axial connection movement, the other mating piece also including an internal gas flow path that is adapted to receive the gas flow from the gas delivery apparatus and conduct the gas flow to the gas passageway of the one mating piece upon interconnection of the two mating pieces with the relative axial connection movement; the other mating piece including a resilient sealing member carried on the

25 other mating piece, said improved mating piece comprising:

a sealing surface extending generally parallel with the axis for a distance along the axis and at a location which contacts and seals against ~~[[by]]~~ the sealing member by engaging the sealing surface principally with radial compression force upon the two mating pieces connecting ~~with relative~~ during a range of relative

30 axial connection movement extending from before the two mating pieces achieve a fully connected relationship.

23. (Original) An improved mating piece as defined in claim 22, wherein:
the sealing surface is generally cylindrically-shaped and concentric
about the axis.

24. (Original) An improved mating piece as defined in claim 23, wherein:
the gas flow and the RF energy are conducted in a location within the
connected mating pieces circumscribed by the sealing surface.

25. (Canceled)

26. (Currently Amended) A gas-assisted electrosurgical accessory
connector formed by two mating pieces connectable to one another with a relative
rotational connection movement along an axis toward one another, the accessory
connector conducting a gas flow and RF electrical energy between the two mating
5 pieces comprising: ~~An accessory connector as defined in claim 25~~
a retention mechanism operative between the mating pieces when
connected with relative connection movement, the retention mechanism restraining
the connected mating pieces against rotation with respect to one another to separate
from one another along the axis, wherein the retention mechanism comprises:

10 a recess formed on one of the mating pieces;

a retention member carried on the other one of the mating pieces, the
retention member moving into the recess upon the two mating pieces connecting with
relative connection movement, the retention member moving out of the recess from
manual rotational force applied between the two mating pieces to separate the mating
15 pieces from one another.

27. (Original) An accessory connector as defined in claim 26, wherein:
the one of the mating pieces upon which the recess is formed includes
a cylindrical end portion;

the other one of the mating pieces upon which the retention mechanism
5 is carried comprises an annular slot into which the cylindrical end portion extends
upon connection of the mating pieces with relative connection movement;

the cylindrical end portion includes a detent formed therein;

the recess includes the detent; and

the retention member includes a ball positioned in the other one of the
10 mating pieces at a position within the annular slot to contact and extend within the
detent upon connection of the mating pieces with relative connection movement and
to withdraw from within the detent upon separation of the mating pieces from one
another.

28. (Original) An accessory connector as defined in claim 27, wherein the
retention mechanism further comprises:

a biasing member contacting the ball to bias the ball into the detent
upon connection of the mating pieces and to resist withdrawal of the ball from the
5 detent upon separation of the mating pieces.

29. (Currently Amended) A method of connecting together two mating
pieces of a gas-assisted electrosurgical accessory to a gas-assisted electrosurgical
unit by interconnecting a male mating piece and a female mating piece to conduct RF
electrical energy and a gas flow from the gas-assisted electrosurgical unit to the
5 electrosurgical accessory; the gas-assisted electrosurgical unit generating the RF
electrical energy and delivering the gas flow; the electrosurgical accessory including
the male mating piece, an accessory hose, an accessory conductor, a nozzle
connected to receive the gas flow from the accessory hose and to issue the gas flow
as a flow stream, and an electrode positioned within the nozzle and connected to the
10 accessory conductor to transfer the RF energy to ionize conductive pathways within
the flow stream; the male mating piece including a gas passageway that is fluidly
connected to the accessory hose, the male mating piece also including a connector
electrode that is electrically connected to the accessory conductor; the female mating
piece including an electrical terminal that is connected to receive the RF energy
15 generated by the gas-assisted electrosurgical unit and to electrically contact the
connector electrode of the male mating piece upon connection of the female and
male mating pieces, the female mating piece also including an internal gas flow path
that is connected to receive the gas flow delivered from the gas-assisted

electrosurgical unit and to conduct the gas flow to the gas passageway of the male
20 mating piece upon interconnection of the female and male mating pieces; said
method comprising:

connecting the two mating pieces by moving the two mating pieces
together along an axis in a relative axial connection movement;

contacting a sealing member carried on one mating piece with a sealing
25 surface formed on the other mating piece, the sealing surface extending generally
parallel with the axis for a distance along the axis; and

resiliently compressing the sealing member in a radial direction relative
to the axis in contact with the sealing surface to establish a gas tight seal over a
range of ~~the~~ relative axial connection movement extending from before the mating
30 pieces achieve a fully connected relationship.

30. (Currently Amended) A method as defined in claim 29, further
comprising:

conducting ~~[[a]]~~ gas flow and RF electrical energy between the
connected two mating pieces; and

5 contacting and sealing the sealing member with the sealing surface over
~~a range of relative connection movement of the two mating pieces over~~ a portion of
the predetermined length of the sealing surface along the axis.

31. (Original) A method as defined in claim 30, further comprising:

conducting the gas flow and the RF electrical energy in a space
circumscribed by the sealing surface and the contact of the sealing member with the
sealing surface.

32. (Original) A method as defined in claim 29, wherein the sealing surface
is generally cylindrically-shaped and concentric about the axis, and the sealing
member is annularly shaped.

33. (Currently Amended) A method as defined in claim 29, further
comprising:

restraining the connected mating pieces against separation from one
another ~~with movement away from one another~~ along the axis.

34. (Original) A method as defined in claim 33, further comprising:
restraining the connected mating pieces against separation by moving a
retention member carried by one mating piece into a recess formed in the other
mating piece upon the two mating pieces connecting with relative connection
5 movement; and

moving the retention member out of the recess with manual force
applied between two connected mating pieces to separate the mating pieces from
one another.

35. (Original) A method as defined in claim 34, further comprising:
rotating the two mating pieces in one relative rotational direction with
respect to one another to connect the mating pieces with relative connection
movement; and
5 rotating the two mating pieces in the other relative rotational direction
with respect to one another to separate the mating pieces.

36. (Original) A method as defined in claim 34, further comprising:
biasing a ball member into the recess upon connecting the two mating
pieces with relative connection movement; and
overcoming a bias force biasing the ball member into the recess by
5 manual force of rotating the two mating pieces in the other relative rotational direction
to move the ball from the detent to permit separation of the mating pieces.

37. (Original) A method of connecting together and disconnecting two
mating pieces of gas-assisted electrosurgical accessory in a connected together
relationship, comprising:
connecting the two mating pieces by moving the two mating pieces
5 together along an axis in a relative connection movement;
contacting a sealing member carried on one mating piece with a sealing
surface formed on the other mating piece, the sealing surface extending generally
parallel with the axis for a distance along the axis;
conducting a gas flow and RF electrical energy between the two
10 connected mating pieces;

restraining the connected mating pieces against separation by moving a retention member carried by one mating piece into a recess formed in the other mating piece upon the two mating pieces connecting with relative connection movement; and

15 moving the retention member out of the recess with manual force applied between the two mating pieces to separate the mating pieces from one another.

38. (Original) A method as defined in claim 37, further comprising:

rotating the two mating pieces in one relative rotational direction with respect to one another to connect the mating pieces with relative connection movement;

5 biasing a ball member into the recess upon connecting the two mating pieces with relative connection movement;

rotating the two mating pieces in the other relative rotational direction with respect to one another to separate the mating pieces; and

overcoming a bias force biasing the ball member into the recess by
10 manual force of rotating the two mating pieces in the other relative rotational direction to move the ball from the detent to permit separation of the mating pieces.

39. (Original) A method of connecting a gas-assisted electrosurgical accessory to a gas-assisted electrosurgical unit by interconnecting a male mating piece and a female mating piece to conduct RF electrical energy and a gas flow from the gas-assisted electrosurgical unit to the electrosurgical accessory; the gas-assisted
5 electrosurgical unit generating the RF electrical energy and delivering the gas flow; the electrosurgical accessory including the male mating piece, an accessory hose, an accessory conductor, a nozzle connected to receive the gas flow from the accessory hose and to issue the gas flow as a flow stream, and an electrode positioned within the nozzle and connected to the accessory conductor to transfer the RF energy to
10 ionize conductive pathways within the flow stream; the male mating piece including a gas passageway that is fluidly connected to the accessory hose, the male mating piece also including a connector electrode that is electrically connected to the

accessory conductor; the female mating piece including an electrical terminal that is connected to receive the RF energy generated by the gas-assisted electrosurgical unit and to electrically contact the connector electrode of the male mating piece upon connection of the female and male mating pieces, the female mating piece also including an internal gas flow path that is connected to receive the gas flow delivered from the gas-assisted electrosurgical unit and to conduct the gas flow to the gas passageway of the male mating piece upon interconnection of the female and male mating pieces; said method comprising:

radially sealing the interconnected female and male mating pieces to create a gas-tight seal between the gas flow path and the gas passageway when the mating pieces are interconnected with one another.

40. (Original) A method as defined in claim 39, wherein the female mating piece includes an outer wall that defines a cylindrical recess, and the male mating piece includes a radially compressible gas seal that surrounds the gas passageway, further comprising:

5 inserting part of the male mating piece and the gas seal into the cylindrical recess to establish a radial seal between the mating pieces by radially compressing the gas seal between the male mating piece and the cylindrical recess.

41. (Currently Amended) A method as defined in claim 39, wherein the female and male mating pieces each include threads which are meshed together when the mating pieces are interconnected by screwing the male mating piece into the female mating piece, one mating piece including a recess and the other mating piece including a restraining member biased into contact with the recess upon interconnecting the mating pieces, including the method further comprising:

biasing the male mating piece against unscrewing from the female mating piece by contacting the restraining member with the recess and biasing the restraining member within the recess to resist relative unscrewing movement of the male mating piece from the female mating piece.